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TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No. **14875**

In Re Application Of: **Stephen F. Bush**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/994,447	**November 27, 2001**	**Fred O. Ferris, III**	**23389**	**2128**	**9513**

Invention: **ROBUST UNINHIBITED AIR VEHICLE ACTIVE MISSIONS**

COMMISSIONER FOR PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:

May 15, 2006

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Dated: **July 18, 2006**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Stephen F. Bush	**Examiner:**	Fred O. Ferris, III
Serial No:	09/994,447	**Art Unit:**	2128
Filed:	November 27, 2001	**Docket:**	14875
For:	ROBUST UNINHIBITED AIR VEHICLE ACTIVE MISSIONS	**Dated:**	July 18, 2006
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APPEAL BRIEF

Sir:

Pursuant to 35 U.S.C. § 134 and 37 C.F.R. § 41.37, entry of this Appeal Brief in support of the Notice of Appeal filed May 15, 2006 in the above-identified matter is respectfully requested. This paper is submitted as a brief setting forth the authorities and arguments upon which Appellant relied in support of the appeal from the Final Rejection of Claims 1-8 in the above-identified patent application on November 14, 2005.

I. REAL PARTY OF INTEREST

The real party of interest in the above-identified patent application is Lockheed Martin Aeronautics Company.

II. RELATED APPEALS AND INTERFERENCES

There are no pending appeals or interferences related to this application to Appellant's knowledge.

III. STATUS OF CLAIMS

Claim 1 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,122,572, Yavnai (hereinafter "Yavnai") in view of "An Architecture for Modeling Uninhabited Aerial Vehicles", Draper et al, IEEE 0-7803-5731-0/99, IEEE 1999 (hereinafter "Draper").

Claim 2 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

Claim 3 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

Claim 4 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

Claim 5 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

Claim 6 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

Claim 7 stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

Claim 8 stands rejected based on 35 U.S.C. § 101 as being drawn to non-statutory subject matter, and stands rejected based on 35 U.S.C. § 103(a) as being unpatentable over Yavnai in view of Draper.

IV. STATUS OF AMENDMENTS

The claims were not amended in the Response to the Final Rejection filed April 14, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present application, U.S. patent application Serial No. 09/994,447 filed on November 27, 2001, originally included Claims 1-8.

In an Official Action dated June 27, 2005, the Examiner rejected Claims 1-8 under 35 U.S.C. § 101 as allegedly drawn to non-statutory subject matter. Claims 1-8 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 6,122,572 to Yavani (hereinafter, "Yavani"), in view of "An Architecture for Modeling Uninhabited Aerial Vehicles", IEEE 0-7803-5731-0/99, by Ruff, et al. (hereinafter, "Draper" for consistency with the Office Action nomenclature). The specification was objected to for improper inclusion of an external URL.

In a Response under 37 C.F.R. § 1.111 filed September 27, 2005, Appellant disagreed with the Examiner's rejections. In response to the Examiner's objection, Appellant deleted the URL at paragraph [0018] of the original specification. In its place, reference was made to the hard copy of the article made of record by IDS concurrently with the filing of the application. Appellant amended paragraph [0011] in the specification to include the serial number of the concurrently filed patent application referenced therein. Claims 4 and 5 were amended to correct a minor editorial oversight in spelling. No other amendments to the Claims was made. In response to the 35 U.S.C. § 101 rejection, Appellant submitted arguments

traversing the rejection of the Claims. In response to the 35 U.S.C. § 103(a) rejection, Appellant submitted arguments distinguishing the claimed invention from the cited prior art.

In the Final Official Action issued November 14, 2005, the Examiner withdrew the objection to the specification in view of Apellant's amendment to the specification. The Examiner withdrew the rejection under 35 U.S.C. § 101 of Claims 1-7 as being tangibly embodied by reciting encoding the optimized command sequence in an active (network) packet. The Examiner reiterated the rejection of Claim 8 under 35 U.S.C. § 101 as not providing a concrete and tangible result. The Examiner did not find Appellant's arguments persuasive with respect to the 35 U.S.C. § 103(a) rejections. The Examiner reiterated the rejection of Claims 1-8 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent 6,122,572 to Yavnai in view of "An Architecture for Modeling Uninhabited Aerial Vehicles", Draper et al, IEEE 0-7803-5731-0/99, IEEE 1999.

Appellant traversed the Examiner's rejections in a Response under 37 C.F.R. § 1.116 filed on April 14, 2006. Subsequently, an Advisory Action issued on May 22, 2006. A Notice of Appeal was filed on May 15, 2006.

Consequently, Claims 1-8 are the claims on appeal. A copy of the rejected Claims is attached hereto in the Claims Appendix.

The invention with respect to Claim 1 comprises a method of optimizing a command sequence for a UAV to accomplish mission objectives, comprising the steps of:

(a) simulating the performance of an initial command sequence by a UAV in a simulated environment (104)(page 5, para [0012]), resulting in a simulated mission outcome(page 9, para [0019]; (b) modifying the command sequence (116)(page 9, para [0020]) of said mission; (c)

simulating the performance of said modified command sequence by a UAV in said simulated environment (110)(page 6, para [0015]), resulting in another simulated mission outcome (page 9, para [0019]); (d) iteratively performing steps (b) and (c) to optimize the simulated mission outcome (114)(page 9, para [0019]); (e) selecting the one or more command sequences based in part upon which command sequences produce an optimal simulated mission outcome (page 10, para [0022]); and (f) encoding each selected command sequence into an algorithmic active packet (118)(page 10, para [0022]).

The invention with respect to Claim 2 comprises the method of optimizing a command sequence for a UAV according to Claim 1, wherein modifying the command sequence comprises using one of a genetic algorithm technique (page 7, para [0016]) and a neural network technique (page 9, para [0020]).

The invention with respect to Claim 3 comprises the method of optimizing a command sequence for a UAV according to Claim 2, wherein modifying the command sequence (116) (page 9, para [0020]) comprises using a genetic algorithm technique (page 10, para [0022]), and further wherein said genetic algorithm comprises a fitness function (page 6, para [0016]) which measures the simulated outcome against mission objectives (106)(page 6, para [0013]).

The invention with respect to Claim 4 comprises the method of optimizing a command sequence for a UAV according to Claim 1, wherein the criteria for an optimal mission outcome include the compressibility of the command sequence (pages 11-12, para [0026]).

The invention with respect to Claim 5 comprises the method of optimizing a command sequence for a UAV according to Claim 4, wherein the compressibility (page 10, para [0022]) of the command sequence is measured according to the Minimum Data Length theorem (page 10, para [0022]).

The invention with respect to Claim 6 comprises the method of optimizing a command sequence (116) for a UAV according to Claim 1, wherein step of encoding a command sequence (118)(page 10, para [0022]) includes representing the commands as an algorithm supplemented by data (page 7, para [0016]).

The invention with respect to Claim 7 comprises the method of optimizing a command sequence for a UAV according to Claim 6, wherein the encoded command sequence achieves an optimal compression (page 10, para [0022]) as measured by the Minimum Data Length theorem (page 10, para [0022]).

The invention with respect to Claim 8 comprises a method of tracking an autonomous UAV (page 4, para [0019]) during the performance of a pre-programmed active mission, comprising the steps of: (a) simulating the performance of the active mission programmed (104)(page 5, [0011]) into the UAV (page 5, para [0010]) in a current simulation of the environment the UAV is operating in; and (b) estimating the present position of the UAV based upon the results of the simulation (pages 12-13, para [0028]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-8 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,122,572, Yavnai in view of "An Architecture for Modeling Uninhabited Aerial Vehicles", Draper et al, IEEE 0-7803-5731-0/99, IEEE 1999.

Whether claim 8 is unpatentable under 35 U.S.C. § 101 as being drawn to non-statutory subject matter.

VII. STATEMENT OF AMENDMENT STATUS

The Claims were not amended in the Response to the Final Rejection filed April 14, 2006.

VIII. ARGUMENT

1. REJECTION UNDER 35 USC § 101 AS BEING DRAWN TO NON-STATUTORY SUBJECT MATTER.

Claim 8.

(A) Examiner's Rejection Of Independent Claim 8 Is Not Proper.

(I) Claim 8 Recites A Concrete And Tangible Result.

The Final Office Action alleges that Claim 8 comprises solely the manipulation of abstract ideas without practical application.

Appellant submits that Claim 8 recites simulating the active mission pre-programmed in the UAV in a current simulation of the operating environment of the UAV. In contrast to the view of the Office Action ("Claim 8 is drawn to the manipulation of abstract ideas by simulation of UAV performance", p. 7), both elements of step (a) require the manipulation of at least that portion of a UAV, i.e., a machine, necessary to effect the claimed output results of the simulation. Therefore, the claims as recited go well beyond the mere manipulation of abstract ideas and are in fact, machine or computer-based methods.

Appellant traverses the Office Action's assertion that Claim 8 does not recite a concrete and tangible result since the result appears to simply be an "estimation" that is based on

a mathematical operation and does not support (or ultimately get used for) the intended utility, (i.e. tracking an autonomous UAV), or that tracking an autonomous UAV during the performance of a pre-programmed mission is not a practical application *per se*. Appellant submits that the specification details a UAV programmed with an optimized command sequence according to the present invention and is able to carry out mission objectives and is simultaneously less vulnerable to detection while receiving a communicated mission while in flight (see, para. [0026]). Similarly, the claimed method of tracking obviates the need for the UAV to transmit status messages that may compromise its safety (see, para. [0027]). Therefore, the practical application of the claimed method is tangible as described in the specification.

Further, MPEP § 2106(IV)(B)(2)(b)(i) [p. 2100-16] describes a "safe harbor" of statutory process claims into which Claim 8 falls. Namely, a process that requires measurements of physical objects or activities to be transformed outside of the computer into computer data is statutory under § 101. In this case, Claim 8 recites simulating the performance of a UAV in a current simulation of the environment the UAV is operating in. The preparation of a current simulated environment necessarily involves the transformation of real world data into the computer for processing as part of the simulation.

Therefore, Appellant respectfully submits that Claim 8 defines statutory subject matter under 35 U.S.C. § 101, and that the rejection is poorly taken. Favorable reconsideration and withdrawal is kindly requested.

2. **Rejection under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,122,572 to Yavnai in view of "An Architecture for Modeling Uninhabited Aerial Vehicles", Draper et al, IEEE 0-7803-5731-0/99, IEEE 1999.**

CLAIMS 1-3, AND 6

(A) Examiner's Rejection Of Claims 1-3, and 6 Is Not Proper.

(I) References Do Not Teach The Use Of Active Packets.

The Office Action avers that Draper teaches active packets. The Office Action further improperly reads statements of operative description provided in the specification as statements of definition. For example, the instant specification does not define an active packet as **ANY** object communicated in an active network, as the Office Action appears to interpret (Office Action, p. 3). Rather the specification merely describes at para. [0005] that the active packet is the object communicated by the active network.

Therefore, Appellant submits, when the term active packet is recited in the claims it should be kept in mind that "claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their 'broadest *reasonable* interpretation.' " *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir., 1983) (emphasis in original) (Quoting *In re Okuzawa*, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976)).

Moreover, a patentee is entitled to omit what is well known to those of ordinary skill in the art. "The specification would be of enormous and unnecessary length if one had to literally reinvent and describe the wheel." *Atmel Corp. v. Information Storage Devices, Inc.*, 198

F.3d 1374, 53 U.S.P.Q.2d 1225 (Fed. Cir. 1999). In this case, an artisan of ordinary skill in the field of active networking at the time the invention was made would have understood the term active packet and/or active network to extend beyond JAVA network, for example the JAVA-based system described in Draper.

In the Advisory Action, the Examiner states that Appellant's arguments relating to a skilled artisan's knowledge of active networks appear to further support the Examiner's 103 obvious rejection since they would have been well known to one of ordinary skill at the time of the invention. Appellant submits that it would not be obvious to one skilled in the art to arrive at the steps of the present application, as the Examiner asserts, but that one skilled in the art would understand the terms active packet and/or active network to extend beyond JAVA network.

Active networking to one skilled in the art, includes active nodes and active packets, and such definition is not met by the JAVA system disclosed in Draper. There is no teaching or suggestion in Draper that the JAVA code is executed within the network nodes, as is the case with algorithmic active packets recited in Claim 1. Therefore, Appellant respectfully submits that Claims 1-3, and 6 are patentably distinguished over the cited references, because all recited claim limitations are not taught or suggested by the applied prior art. See *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Favorable reconsideration and withdrawal of the rejection is kindly requested.

CLAIMS 4, 5 AND 7

(A) Examiner's Rejection Of Claims 4, 5, and 7 Is Not Proper.

(I) (i) Claims 4, 5, and 7 Are Patentable As Dependent On A Patentable Base Claim.

(ii) Compressibility Of The Command Sequence Is Not Disclosed In The Cited References.

Claims 4, 5, and 7 each depend, either directly or indirectly, from independent Claim 1. These dependent claims are submitted as patentable for at least the same reasons as their underlying independent base claim, and for the additional subject matter claimed therein

Referring to Claims 4-5 and 7, Appellant respectfully traverses the alleged admission of the claimed subject matter as prior art in the Final Office Action. The Office Action notes that the (Minimum Data Length theorem) MDL theorem is, as noted in the specification itself at para. [0022], the subject of the Wallace paper. However, there is no admission, teaching or suggestion, that Wallace or any other prior art discloses the use of the MDL theorem or any other measure of compression as a criterion for selecting any particular command sequence. More specifically, it is only the Appellant's own specification that discloses that compressibility of the command sequence may make one particular command sequence more desirable over another less compressible command sequence, even if the less compressible command sequence more closely meets other mission criteria. It is, of course, impermissible to imbue the hypothetical ordinarily skilled artisan with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge. To do so is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor

taught is used against its teacher. See, *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 312-313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Therefore, at least Claims 4-5 and 7 are further distinguished over the prior art.

CLAIM 8

(A) Examiner's Rejection Of Claims 8 Is Not Proper.

(I) References Do Not Disclose Tracking A UAV In The Performance Of A Pre-Programmed Active Mission.

The Office Action states that Appellant's assertions that the prior art does not disclose tracking a UAV in the performance of a pre-programmed active mission is wrong. The Examiner asserts that the limitation is rendered obvious at least by Draper which discloses a preprogrammed mission (course, pp. 747, col. 1, para: 2, Fig. 2) and the Yavnai teaching of UAV tracking (CL38-L10-20). Appellant disagrees. The tracking as claimed in Claim 8 recites tracking a UAV in the performance of a pre-programmed active mission. According to Claim 8, the method of tracking the UAV during the pre-programmed active mission comprises simulating the performance of the active mission programmed and estimating the present position of the UAV based upon the results of the simulation. Draper and Yavnai do not disclose using the results of a simulation to estimate the present position of the UAV. For the reasons set forth above, neither Yavnai nor Draper, taken alone or in any combination, teaches or suggests an active mission as claimed. Therefore, Appellant respectfully submits that the rejection of Claim 8 should be withdrawn, and kindly request favorable reconsideration and withdrawal.

Withdrawal of the rejection to independent Claims 1 and 8, and dependent claims 2-7 is, therefore, respectfully requested.

IX. CLAIMS APPENDIX

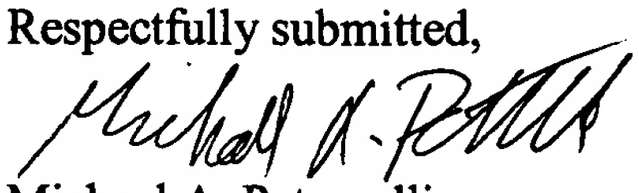
X. EVIDENCE APPENDIX

XI. RELATED PROCEEDING APPENDIX

Based on the above arguments and remarks, Appellant respectfully submits that Claim 8 meets the requirements of 35 USC § 101, and Claims 1-8 of the instant invention on appeal are not obvious in light of Draper and Yavnai, either individually or in combination. Consequently, the rejections of the claims based on 35 USC § 101 and the references are in error. In view of the remarks submitted hereinabove, the references applied against Claims 1-8 on appeal do not render those claims unpatentable under 35 U.S.C. § 103(a). Thus, Appellant submits that the §101 and §103 rejections are in error and must be reversed.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment in connection herewith to Deposit Account No. 19-1013/SSMP.

Respectfully submitted,



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CLAIMS APPENDIX

1. (Rejected) A method of optimizing a command sequence for a UAV to accomplish mission objectives, comprising the steps of:

(a) simulating the performance of an initial command sequence by a UAV in a simulated environment, resulting in a simulated mission outcome;

(b) modifying the command sequence of said mission;

(c) simulating the performance of said modified command sequence by a UAV in said simulated environment, resulting in another simulated mission outcome;

(d) iteratively performing steps (b) and (c) to optimize the simulated mission outcome;

(e) selecting the one or more command sequences based in part upon which command sequences produce an optimal simulated mission outcome; and

(f) encoding each selected command sequence into an algorithmic active packet.

2. (Rejected) The method of optimizing a command sequence for a UAV according to claim 1, wherein modifying the command sequence comprises using one of a genetic algorithm technique and a neural network technique.

3. (Rejected) The method of optimizing a command sequence for a UAV according to claim 2, wherein modifying the command sequence comprises using a genetic algorithm

technique, and further wherein said genetic algorithm comprises a fitness function which measures the simulated outcome against mission objectives.

4. (Rejected) The method of optimizing a command sequence for a UAV according to claim 1, wherein the criteria for an optimal mission outcome include the compressibility of the command sequence.

5. (Rejected) The method of optimizing a command sequence for a UAV according to claim 4, wherein the compressibility of the command sequence is measured according to the Minimum Data Length theorem.

6. (Rejected) The method of optimizing a command sequence for a UAV according to claim 1, wherein step of encoding a command sequence includes representing the commands as an algorithm supplemented by data.

7. (Rejected) The method of optimizing a command sequence for a UAV according to claim 6, wherein the encoded command sequence achieves an optimal compression as measured by the Minimum Data Length theorem.

8. (Rejected) A method of tracking an autonomous UAV during the performance of a pre-programmed active mission, comprising the steps of:

(a) simulating the performance of the active mission programmed into the UAV in a current simulation of the environment the UAV is operating in; and

(b) estimating the present position of the UAV based upon the results of the simulation.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.